

DOCUMENT RESUME

ED 316 137

HE 023 250

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TITLE Using Computer Graphics in the 90's.
INSTITUTION American Association of State Colleges and Universities, Washington, D.C.; State Univ. of New York, Utica/Rome. Inst. of Technology.
SPONS AGENCY State Univ. of New York, Albany.
PUB DATE 90
GRANT 235-6038D
NOTE 12p.; This report is one of a group gathered by the AASCU/ERIC Model Programs Inventory Project, funded by the Fund for the Improvement of Postsecondary Education to the American Association of State Colleges and Universities in collaboration with the ERIC Clearinghouse on Higher Education. For related documents see HE 023 199-261.
PUB TYPE Reports - Descriptive (141)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Computer Graphics; Curriculum Development; Demonstration Programs; Desktop Publishing; Higher Education; Inservice Teacher Education; Microcomputers; Models; Program Descriptions; *Public School Teachers; Secondary School Curriculum; State Universities
IDENTIFIERS *AASCU ERIC Model Programs Inventory Project; Computer Aided Design; Sauquoit Valley Central School (NY); *State Univ of NY Inst of Technology Utica Rome

ABSTRACT

Computer-Aided Design, a hands-on program for public school teachers, was first offered in the summer of 1987 as an outgrowth of a 1986 robotics training program. Area technology teachers needed computer-aided design (CAD) training because of a New York State Education system transition from the industrial arts curriculum to a new curriculum in technology. To meet this need, the State University of New York Institute of Technology at Utica/Rome, in conjunction with Sauquoit Valley Central School, designed a two-week training program to prepare secondary school technology teachers to teach CAD. The program has gained popularity each year, expanding from the original Basic CAD training course to include an advanced class and a course in desktop publishing and presentation graphics. Over 110 teachers have completed the program for 44 hours of inservice training. In this collaborative effort, the schools involved provided experienced and knowledgeable instructors and classrooms with microcomputers, industry provided participants with an overview of practical CAD applications by allowing teacher observation of their operations, and government provided financing. The program has proved effective in keeping teachers current with computer technology and has provided teachers the opportunity to share classroom successes and learn from each other. (Author/MSE)

ED316137

TITLE: Using Computer Graphics in the 90's

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FUNDING AGENCY: The University of the State of New York
The State Education Department
Chapter 53
Grant # 235-6038D

DATES: June 26 - July 7, 1989

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AASCU/ERIC Model Programs Inventory Project

The AASCU/ERIC Model Programs Inventory is a two-year project seeking to establish and test a model system for collecting and disseminating information on model programs at AASCU-member institutions--375 of the public four-year colleges and universities in the United States.

The four objectives of the project are:

- o To increase the information on model programs available to all institutions through the ERIC system
- o To encourage the use of the ERIC system by AASCU institutions
- o To improve AASCU's ability to know about, and share information on, activities at member institutions, and
- o To test a model for collaboration with ERIC that other national organizations might adopt.

The AASCU/ERIC Model Programs Inventory Project is funded with a grant from the Fund for the Improvement of Postsecondary Education to the American Association of State Colleges and Universities, in collaboration with the ERIC Clearinghouse on Higher Education at The George Washington University.

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ABSTRACT

Computer-Aided Design, a hands-on program for public school teachers, was first offered by SUNY Institute of Technology at Utica/Rome in the summer of 1987 as an outgrowth of a 1986 Robotics training program. Area technology teachers were in need of computer-aided design (CAD) training because of a transition in the New York State Education System from an industrial arts curriculum to a new curriculum in technology. To meet this need, SUNY Institute of Technology at Utica/Rome in conjunction with Sauquoit Valley Central School, designed a two-week training program to prepare high school and junior high technology teachers to teach Computer-Aided Design (CAD) in their classrooms.

The teacher training program has gained popularity each year. As well as attracting increasing numbers of teachers, it has expanded from the original Basic CAD Training Course to include an Advanced CAD class as well as a course in Desktop Publishing/Presentation Graphics. More than 110 teachers have completed the two-week training programs, for 44 hours of inservice training. Teachers receive 4.4 CEU credits for completion of the CAD training. (The Desktop Publishing/Presentation Course is 22 hours of training or 2.2 CEU's.)

The Computer Graphics Training Programs are a collaboration between education, industry, and government. SUNY Institute of Technology at Utica/Rome and Sauquoit Valley Central School planned the training programs and supplied experienced and knowledgeable instructors as well as classrooms with micro-computers. Industry provided participants with an overview of the practical applications of CAD by allowing the teachers to observe their CAD operations, and government financed the course through a New York State Legislative Grant sponsored by State Senator James H. Donovan, 47th Senatorial District.

The Computer-Graphics Training Programs have proved an effective means for keeping area teachers current with the latest information in computer technology. They have provided teachers with the opportunity to share their successes in the classroom and learn from each other.

INTRODUCTION

"The Computer Graphics Hands-On Training Program for Teachers" is an extremely successful training program resulting in 110 secondary, primary, and post-secondary teachers learning new computer software packages and skills over a three-year period. The training program was developed and produced to meet educators' needs for additional information in a technological field that is rapidly changing.

This report will include an overview of the program as well as the program objectives and a summary of the program evaluation. Also included is a copy of the 1988 Project Overview that was submitted to the New York State Education Department at the completion of the program.

BACKGROUND

Computer-Aided Design, a hands-on program for public school teachers, was first offered by SUNY Institute of Technology at Utica/Rome in the summer of 1987 as an outgrowth of a 1986 Robotics training program. Area technology teachers were in need of computer-aided design (CAD) training because of a transition in the New York State Education System from an industrial arts curriculum to a new curriculum in technology. To meet this need, SUNY Institute of Technology at Utica/Rome in conjunction with Sauquoit Valley Central School, designed a two-week training program to prepare high school and junior high technology teachers to teach Computer-Aided Design (CAD) in their classrooms.

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DESCRIPTION

The Computer Graphics Training Program has developed into three separate classes: Basic Computer-Aided Design (CAD), Advanced Computer-Aided Design, and Desktop Publishing/Presentation Graphics. Participants in each of the classes receive indepth training on a software package as well as complimentary software, reference books, curriculum materials, and teaching outlines.

Each of the courses has specific objectives.

Basic CAD is designed to:

- o Increase participants' ability to use CAD and provide background in CAD applications.
- o Provide suggestions on how to teach CAD and show techniques that will increase students' productivity.
- o Provide participants with AutoCAD curriculum materials, teaching outlines, and reference books.
- o Provide participating school districts with AutoSketch software.

Advanced CAD is designed to:

- o Increase participants' ability to use AutoCAD with an emphasis on 3D drawing.
- o Same as number two above.
- o Same as number three above.
- o Provide participating schools districts with AutoShade software.

Desktop Publishing/Presentation Graphics is an introduction to common IBM-PC-based computer applications including presentation graphics and desktop publishing. The course focuses on two software packages, Harvard Graphics and First Publisher, and is designed to:

- o Increase the participants' ability to use IBM-PC's.
- o Teach participants how to organize and present data graphically.
- o Teach participants how to integrate graphics with text.
- o Provide instruction in desktop publishing.

ACTIVITIES UNDERTAKEN

These summer training programs have been funded through New York State Education Department Grants. Senator James H. Donovan, R-47 and chairman of the Senate Committee on Education, was instrumental in securing each summer's grant. Along with the free training, participants received complimentary software, reference books, curriculum materials, and teaching outlines. Complimentary meals and refreshments were also provided.

The Center for Training and Professional Development at SUNY College of Technology at Utica/Rome manages the programs handling program publicity; registration of participants; maintenance of Continuing Education Unit (CEU) records; procurement of software, equipment, and instructional materials; and printing of materials.

The CAD Training Programs (Basic and Advanced) were designed as intensive 44-hour courses over an 8-day period. The Basic course, taught by Dr. Digendra Das, consisted of 13 participants and was conducted at SUNY Institute of Technology. The Advanced course, taught by Ken Ford and Craig Kopper, took place at Sauquoit Valley Central School and included 18 participants. Two sites were used in order to take advantage of the computers available and to ensure that class size was small enough that participants would receive individualized instruction.

The advanced class was for instructors who had completed the basic course or who had experience teaching AutoCAD. It included detailed work in 3-D construction. The basic course was for junior high, secondary, post-secondary, and elementary teachers with an interest in CAD.

The desktop publishing/presentation graphics course was 22 hours of instruction over a six-day period. The class was taught by Wells Horton and consisted of 20 students.

Each day's class began with a review and assessment of the previous day's material. New material was then presented by means of lectures and hands-on exercises. New concepts were reinforced with suggested readings, homework assignments, and demonstrations. The CAD classes also had the opportunity to tour Remington Arms, a local manufacturer of firearms, and observe the practical applications of CAD.

Class instruction for the CAD classes was from 9:00 a.m. - 4:00 p.m., June 26 - July 6, (no class July 3 or 4) and on Friday morning, July 7. Participants received 44 hours of high tech training and were awarded 4.4 CEU's (Continuing Education Units).

The desktop publishing/presentation graphics course was from 12:30 - 4:00 p.m., June 28, 29, 30 and July 5, 6 and 9:00 a.m. - 12:30 p.m. on July 7. Participants received 22 hours of training and were awarded 2.2 CEU's.

On the afternoon of the final day, participants were recognized for their completion of the program at a final luncheon held at SUNY Institute of Technology at Utica/Rome. Several of the teachers' superintendents and building principals attended the luncheon in order to recognize their teachers for their dedication in acquiring new skills. Richard Pfister, Director of Finance, Senate Education Committee, represented Senator James Donovan at the Luncheon and publically acknowledged the participants for their enthusiasm for learning. Dr. Robert Leidig, Vice President Administration at the Institute of Technology expressed the college's pleasure at hosting the program and acknowledged the benefits of the college and the local school districts working together to keep abreast of the latest technological developments.

Each participant received a framed certificate for completing the course and a complimentary copy of the software package learned during the training program.

PEOPLE SERVED

The participants served by this program were all teachers. In order to identify teachers interested in this program, brochures were mailed to the 94 teacher centers in New York state and the 41 school districts in the 47th senatorial district. Specifically targeted were the 154 members of the Mohawk Valley Technical Educator's Association and the members of the New York State Technical Educator's Association, since these are the people who would be most likely be interested in a CAD course. Faculty members in the technology and engineering departments of all local colleges were also invited to participate. In all, a total of 2500 brochures were disseminated.

PERSONNEL INVOLVED

Planning Committee

Dr. G. Daniel Howard, Vice President for Academic and Student Affairs, SUNY Institute of Technology at Utica/Rome

Dr. Violet Towne, Director, Center for Training and Professional Development, SUNY Institute of Technology at Utica/Rome

Kenneth Ford, District Coordinator for Computers, Sauquoit Valley Central School

Donald MacLane, Superintendent, Sauquoit Valley Central School

ADVANCED COURSE INSTRUCTORS

Kenneth Ford, District Coordinator for Computers, Sauquoit Valley Central School. Mr. Ford has taught CAD at the high school level for seven years and was one of the instructors in the SUNY Teacher Training Program for the last three summers.

Craig Kopper, Technology Teacher, Sauquoit Valley Central School. Mr. Kopper taught the CAD training Program in both 1988 and 1989 and received excellent reviews each year.

BASIC COURSE INSTRUCTOR

Dr. Digendra Das, Associate Professor, Mechanical Engineering Technology, SUNY Institute of Technology at Utica/Rome. Dr. Das is the college's expert on CAD and consults with many local businesses on their computer design needs.

DESKTOP PUBLISHING/PRESENTATION GRAPHICS INSTRUCTOR

Mr. Wells Horton, faculty member, Computer Science Department, SUNY Institute of Technology at Utica/Rome. Mr. Horton has a Master's Degree in Computer Science and has taught a variety of computer science classes at SUNY Institute of Technology.

LAB ASSISTANTS

Vincent Bastien, Advanced Course, Sauquoit Valley Central School

Glynn Bebee, Advanced Course, Sauquoit Valley Central School

Mike Croghan, Basic Course, SUNY Institute of Technology

Eric Schloop, Basic Course, SUNY Institute of Technology

PROJECT STAFF

Kathleen Clements, Program Manager, Center for Training and Professional Development, SUNY Institute of Technology

Jean Kinsella, Program Secretary, Center for Training and Professional Development, SUNY Institute of Technology

Sandra Denison, Registration Manager, Center for Training and Professional Development, SUNY Institute of Technology

PROJECT ADMINISTRATION

Dr. G. Daniel Howard, Grant Director
Vice President For Academic Affairs and Graduate Studies, SUNY
Institute of Technology

Dr. Violet Towne, Grant Manager
Director, Center for Training and Professional Development, SUNY
Institute of Technology

COSTS

The 1989 program was funded by a \$55,000 grant from the New York State Education Department. The expenses included:

Course Instructor Salaries	\$10,550
Lab Assistant Salaries	1,320
Program Management	15,377
Lunches, refreshments, etc.	6,759
Textbooks	3,420
Postage	1,200
Printing	1,235
Software	7,700
Office Supplies	3,227
Miscellaneous	1,592
Indirect Costs	2,619

RESULTS

Evaluation Procedures

During the last day of the program, each participant completed an evaluation form designed to assess the effectiveness of the instructors and the overall success of the program. During the three summers the program has been offered, the courses and the instructors have received superior ratings and favorable comments from the participants. Program evaluations have averaged 4.6 or better out of a possible 5.0, while the instructor ratings have averaged 4.7/5.0. Another success indicator is the fact that 96% of the participants have expressed interest in additional technological training programs.

Based on the evaluations, the Computer Graphics Training Program must be judged a success. The instructors were praised for their methodology, dedication, and patience and received

outstanding overall ratings. The course content was rated extremely favorably and included many positive comments.

CHANGES IN PEOPLE SERVED

The two major changes observed in the participants were: their increased understanding of the material presented and their increased skill on the computer. By the end of the course, participants were extremely conversant with the software packages and expressed a definite understanding of the hardware needed to run the program.

The conclusion that participants gained a better understanding of the topic can also be drawn from the evaluation forms - in particular, the response to the question which asked participants to evaluate their increased understanding of the software package. The average response was 4.90 out of 5.00 with 27 of the 29 participants providing a perfect 5.00 rating.

UNEXPECTED ACCOMPLISHMENTS

Though it was expected that teachers would be interested in this technological training, the support of the school districts for this program was uncertain. As it turned out, teacher participation in the computer graphics training program was strongly endorsed by area school administrators. This was demonstrated by some school districts granting their teachers paid summer sabbaticals and/or reimbursing them for travel expenses to and from program sites. Other districts purchased micro-computers to enable their teachers to initiate or expand CAD instruction - thus more fully realizing the benefits of the training. Still other schools encouraged their teachers to participate by awarding them salary increments.

An unexpected result of the program was the overwhelming desire by the participants for more technical training courses. With changes in technology occurring so fast, teachers are feeling the need for this type of training on an on-going basis so they can keep up.

CONCLUSIONS AND RECOMMENDATIONS

On many levels, the "Computer Graphics Training Program for School Teachers" must be deemed a success. Attendees received introductory training in a new technological field, gaining valuable new skills and instructional materials for use in their classrooms. Their favorable comments and superior ratings of the course demonstrated their satisfaction with the instructors and their enthusiasm for the program as a whole. Participating schools gained better trained teachers and licensed software

packages. Finally, area students and their parents benefited from the improvement in the quality of local education that resulted from the program; - ie., having introductory computer training available within their own schools.

The Computer Graphics Training Program is a positive example of cooperation between secondary and higher education with representatives of both Sauquoit Valley Central School and SUNY Institute of Technology at Utica/Rome playing key roles in the planning and execution of the program. In broader terms, the program represents a successful collaboration among education, business, and government. Education provided the facilities, management, and delivery of the program; business provided a site tour; and government returned state tax dollars to the local constituency.

Perhaps the single most important conclusion to be drawn from the program is that it generated demand for more programs of its type. This is the highest endorsement of the program's quality - that it should serve as model for an effective strategy to keep teachers current with the latest high-tech knowledge.

REPEATABILITY

This program would be an extremely useful program for other colleges or universities to replicate because teachers look to higher education for information and training on the latest technology. With the United States in the midst of a technological revolution, it is important that information be passed on to the public schools on a regular and ongoing basis.